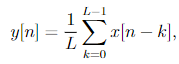
SYDE 252 project 1

Objective:

1. Filter the audio signal to make it sound different and maybe better?
2. Analyze the audio signal

Project breakdown:

1. Read the sound files into matlab. Clean it up:
   1. 1 input channel
   2. Tune sampling rate to 16k hz
2. Get rid of noise
   1. Moving average filter



L is the window size.

* 1. Weighted moving average filter



Sum of weight (b) should add up to 1. Coefficient is determined by the Gaussian filter.

* 1. Median filter



L is the window size.

1. Analyze 3 sound files
2. number of syllables in the speech clip
3. beats per minute in the drum clip maybe we can determine the tempo of different element of the drums
4. detect the silent regions in the birds clip. Show at least one plot of the signal.

Hint: find peaks

Research and report questions:

1. What is a Gaussian filter?
2. How to determine the appropriate weight for the Gaussian filter?
3. Tune the window size of the various filter and determine the best one which was

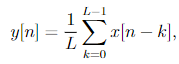
sufficient for removing noise. Tabulate your results

1. Which filter and window size worked the best? Provide a full analysis.
2. Describe the moving average filter as an appropriate impulse response function in the

discrete and continuous domain.

1. Using Eq.(1) how would you define a high pass filter? provide only one mathematical

definition and explain what it does in one example as I described each filter above.



Research notes:

Read audio file: <https://www.mathworks.com/help/matlab/ref/audioread.html>

Write audio file: <https://www.mathworks.com/help/matlab/ref/audiowrite.html>

Plot audio waveform: <https://www.mathworks.com/matlabcentral/answers/22112-how-to-plot-wav-file>